

# Canadian Computer Wholesaler

THE RESELLER'S RESOURCE

Vol. 1 No. 5

A Primer on

## Optical Storage

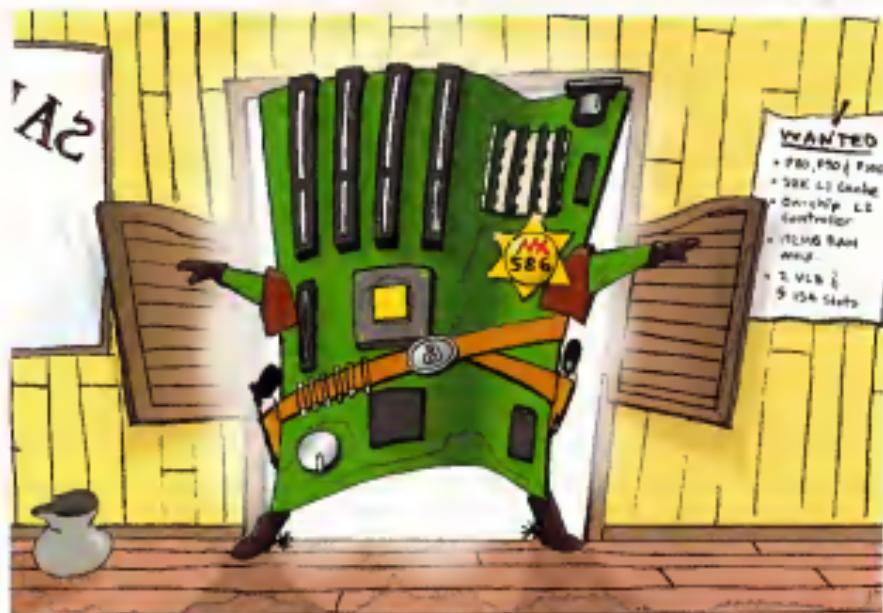
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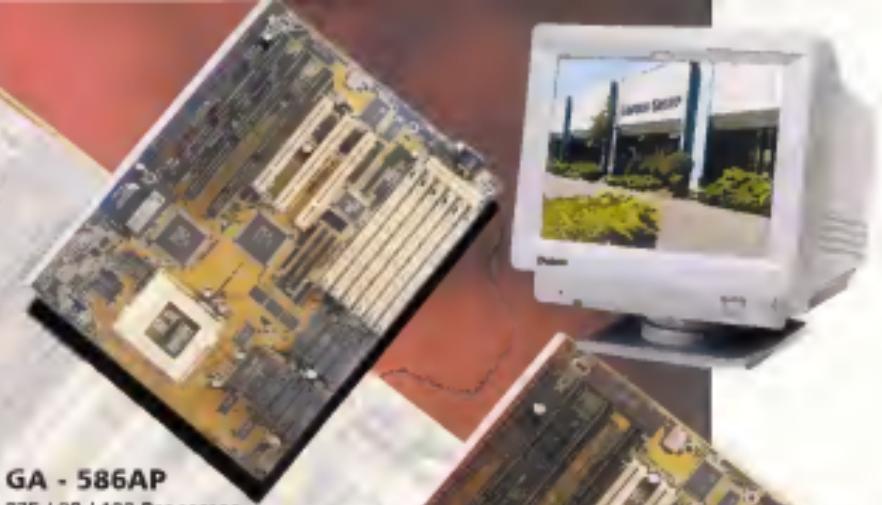
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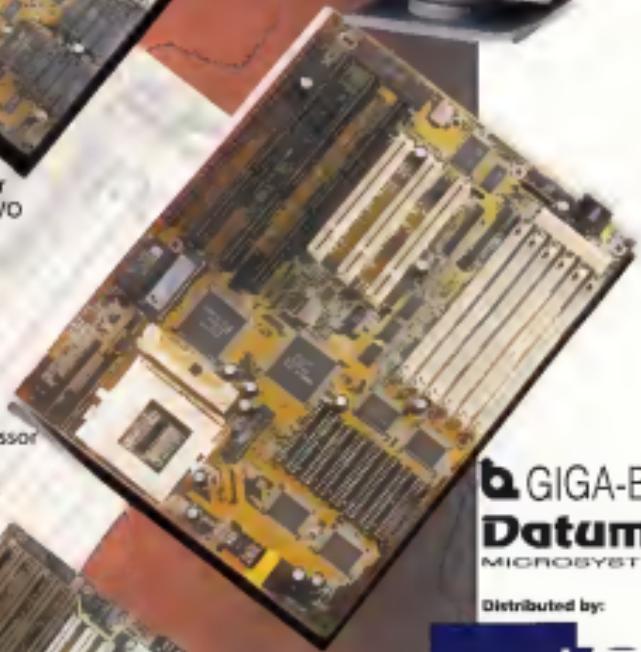
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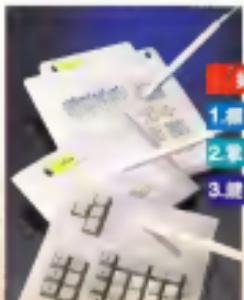


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**Publisher/Editor** Jim Clark

**Marketing Director** Jim L. Ding

**Associate Editor** Alan Zeman

**News Editor** Jim Clark

**Contributing Writers** Edward Pugatch

Barbara Allen

Malcolm A. Cook

Philip Ryans

**Production Manager** Karen Clark

**Production Staff** Shirley Ho

**Sales Manager** Li Ding

**Account Managers** Jim Clark

Randy Chester

**Circulation Manager** Li Ding

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**Canadian Computer Wholesaler**

205-1788 West Broadway

Vancouver B.C. Canada V6J 1Y7

Tel: (604) 739-8186

Fax: (604) 739-1829

Web Site: <http://www.caaweb.ca>

**Internet E-mail address:**

[Editorial@computer-player.com](mailto:Editorial@computer-player.com)

**Canadian ID:** 76640-1756

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# Erasable Optical Stimulates Write-Once Applications

Malcolm R. Cocks



that 80 percent of data stored on magnetic drives is never altered.

However, even though users could have both technologies in a single unit, they had to choose between phase-change technology that provided rewritable and true WORM or magneto-optic (MO) rewritable and soft or CCW (Continuous Composite WORM) (Figure 1).

Despite the fact a good software person could override the write-once protection of CCW media, it gained a following. To solve the shortcomings of CCW (often called square by detractors), absolute WORM was reintroduced. This technology provides true WORM capabilities by physically altering the media during the write process.

With the introduction of economical CD recorders and very inexpensive CD-R media, people are questioning whether or not WORM media will be able to compete against CDs which use lower archiving costs to possess vs. racks.

All three WORM technologies offer high-capacity, reusability, durability, longevity and a low storage cost; however, there are subtle but important differences in the technologies. Organizations have to understand their storage and retrieval requirements as well as the strengths and weaknesses of the technologies to determine which option is best for their application.

## Write-Once Technologies

### True WORM

Today, there are four WORM options available to users. Three of these options—phase-

change, absolute and dye polymer—recently received certification that they meet ISO (International Standards Organization) 9171 specifications for true WORM media. The fourth WORM, CD-erasable, is a viable alternative if users have a clear understanding of their requirements and the technology's limitations.

For experts' stock of 3½" dye polymer as anything more than "an interesting" technology, because few drives are currently available.

For unquestioned security, longevity and reliability, people are turning to realize that write-once media is the ideal solution when they must retain and protect documents, data or images from alteration or loss. To the end user, the data stored on write-once optical media appears as though it was stored on a hard disk. When a file is recalled, it can be updated and edited by writing a new account on the disk. When a file is deleted, it no longer appears in the directory.

The difference between ISO 9171 write-once optical solutions and standard hard disk storage methods is that write-once media is safe from accidental erasures, malicious sharing, computer viruses, stray magnetic fields and other factors that can compromise the integrity of the data. Somewhere on the disk, normally transparent to the user, every version of every file is permanently stored, including files that have been "deleted." These files are accessible in a read-only mode using special utilities that provide an audit trail.

Because of the security they provide, banks, insurance companies, health care institutions, accounting departments and government agencies are using true WORM media.

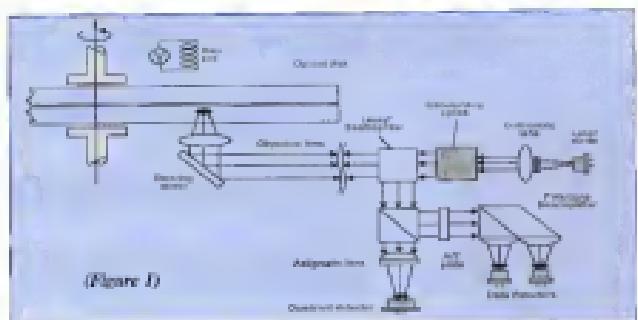
**W**hen erasable optical media was introduced a number of years ago, in-dustry analysts said write-once, reusability (WORM) would quickly fade from the scene. WORM didn't do and erasable optical didn't quite enjoy the widespread acceptance that was anticipated.

The problem was, people had to make a decision at the outset if they wanted the security of write-once media or the convenience of reusable media. Forced to make a choice, far too many prospective optical users made the third choice ... they postponed the decision.

When multifunction optical disk drives and jukeboxes entered the market, the inevitable vs. WORM controversy was virtually laid to rest. Multifunction systems gave users a single system that accepts both write-once and reusable media. Many people, who would never have considered buying a write-once drive, have purchased multifunction drives and jukeboxes and benefit from their WORM capability at no extra cost.

People quickly discovered what industry analysts have shown all along: it is durability—not erasability—that most applications require. For example, BIS International, an industry research firm, found that 80 percent of the data stored on magnetic tape is never erased and

# COVER STORY



With the approval of ISO 9171, a number of countries in Europe have specified that government agencies must use the media of choice to have their archived information considered true copies. These same agencies are specifying that they will only accept documents and data on ISO-compliant WORM media.

Data is written to phase-change disks by two methods. The first involves laying high-reflectivity bubbles on a low-reflectivity textured spiral data surface. With the second approach, the optical drive's laser system creates reflective crystalline spots on a low-reflectivity amorphous surface. The diameter of the data spot will be a 0 or 1. The writing and reading technology is similar to that used by CD-recordable drives, which use a dye-polymer coating on a gold reflective layer. Both techniques are, however, rated by seeing changes in reflectivity.

In the ablation approach, the drive uses a laser which makes a permanent change to spots on the recording layer of the double-sided disk. As the disk rotates (similar to a hard drive), a second, low-power laser "reads" the stored data. Variations in the reflected light caused by the pits and lands are detected and translated into computer readable data.

The ablatable WORM media also provides data integrity and security, since data can be written once and cannot be overwritten or modified. When the computer requests modified or unmodified information, it automatically accesses the most current file.

Phase-change and ablatable WORM are often viewed as tamper-proof archiving. The pros and cons of write-once technology are

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## WORM Pros

- With multifunction drives and platters, users have the flexibility of using write-once media or reusable in the same unit.
- Seek times are now as fast as 2ms making near-realtime retrieval a reality.
- WORM media is now available in capacities up to 3.2GB in a 3.5" case and capacities will continue to increase.
- Some WORM media is guaranteed to provide a data life of 50 plus years, making it the safest media on the market for long-term storage.
- WORM media can be written to in the same manner users write to a hard disk, sector by sector. Retailers and users prefer the con-

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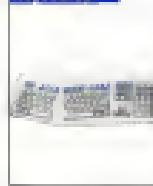
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# COVER STORY

vulence of this media for document imaging, or open to laser disk (OOLD), medical imaging and financial/ legal document storage.

- Pre-performance enhancements continue to be made in the optical industry to keep pace with users' almost insatiable demand for more "on-line" storage.
- Today's multibunction systems have broad, user-proven software available to interface jolinkages to virtually any operating system.

## CCW or Pseudo WORM

Most Crosswave Computer WORM (CCW) recording and reading techniques currently in use conform to ISO/MIEC DIS 11990 and ANSI draft standard X3.220-1990. In this approach to write-once, phase encoded pits (PEP) and standard format pits (SPP) codes are placed into the media to permanently differentiate write-once from rewritable media. The unique codes are read by optical drives so that the appropriate drive command set is invoked.

In addition to media protection, which is added into the disk's recording layer, CCW uses a three-stage protection process, including data management pointers

**CD-ROM disk**



A standard CD-ROM has a layer of reflective aluminum sandwiched between a protective coating and a substrate. A data laser beam reads pits stamped into the aluminum.

**CD-R disk**

A CD-R also is stamped with grooves to guide the writing laser, which creates the original data layer. This is followed by the gold reflective layer. Data is saved because it is highly reflective and less likely to reflect.

**CD-RW disk**

CD-RW disks are recorded and re-recorded over and over again.

CD-RW disks are highly reflective and less likely to reflect.



(Figure 2)

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# Cover Story

(DMAPI), inspection of the error code correction (ECC) sample and whole-block read with error correction.

The technology used in COW or rewritable/movable media is a confluence of magnetic and optical technologies (Figure 2). Both technologies are used to store and retrieve data.

To write to a disk, the drive must be able to change the magnetic orientation of a spot without affecting the nearby spots. This is the function of the drive's "write" laser. When the disk is manufactured, every spot on the recording layer has the same magnetic orientation—the default condition. When the drive writes to the medium, it must ensure that every area it writes to is in the default condition. As a result, the drive must flip “unwritten” the area of the disk before writing can occur. This effectively doubles the write time, compared to one WORM or other read/write technologies.

In addition, unlike magnetic storage and other pure optical alternatives, magneto-optic drives cannot write data in a live format, as entire track areas will be completely erased and then re-written.

COW is often called pseudo WORM because while it does provide write protection, knowledgeable software experts can modify the drive command sets. The stored information can then be erased or overwritten so the disk can be otherwise reformatted. Many see this COW “world” approach as comparable to the write-protect tabs used for floppy disk protection.

For many backup and file-storage applications, COW will provide adequate information protection. However, when an organization wants to know without a doubt that the information they recorded cannot be tampered with, only true write-once technologies will provide this assurance.

## CD-Recordable

Since CD recordable is similar to phase-change optical and uses pure optical technology (Figure 3), many feel that it is an appealing low-cost alternative to WORM media. While CDs are prevalent at home and in the office (more than 3,000 CD titles are now being published) and the cost of using a CD recorder (hardware and software) has dropped dramatically, its use is often misunderstood.

CD-R is an excellent, cost-effective method for distributing limited copies of high-capacity text and digital audio files, invitation and even video clips. Large volumes of information can be permanently archived on a daily or weekly basis and economically distributed to key offices throughout the state, across the country or around the globe.

Because the standards are well established, CD recorders have become very affordable and widely available. Many organizations have found it an ideal solution for producing their own CD masters or “one-off” short-run discs in-house for a price of less than \$13 each or about \$0.04 per MB.

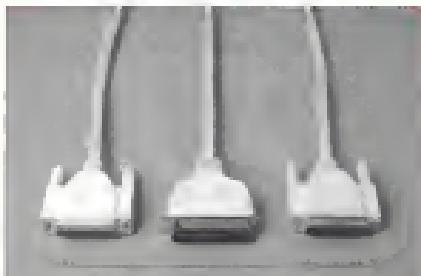
CD recording, while a relatively easy process, is not the same as writing to hard or optical disks.

The CD-R software translates and organizes the data and/or image onto an ISO 9660 image for placement on the CD-R disc. A virtual image is generated by creating a file that contains the directory structure and position. Once the user is satisfied with the performance and data structure, the information is written to the CD in a single, uninterrupted pass.

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While you can carry out multiple writes to the same 650MB disc, each write session adds overhead in the form of headers and pointers which reduces the actual storage capacity. CD recorder manufacturers often tout 99 write-session capabilities. This is theoretically possible, however, considerable media space is eaten up by overhead and housekeeping functions, and soon quickly comes to realize that they should group files and limit write sessions to no more than ten. This provides storage flexibility and makes optimum use of the disc storage capacity.

Any interruption during the write process, such as a power surge or poor coding instructions, will damage the ongoing session and ruin the low-cost CD-R disc. Nevertheless, since the media is so inexpensive, few users are upset about throwing away a few bad discs or distributing discs that have as little as 100MB of information on them.

While CD-recorders has obvious benefits to software and multimedia publishers during their prototype development phase, general business will purchase the tool's share of the recorders and media to archive, back up and distribute compensated information and documents.

It is an excellent solution for sales and marketing departments for producing and dis-

tributing catalogs and price lists. Accounting departments can provide long, detailed invoices on disc so customers can directly import the information to their systems for other reports and analysis. Support organizations can provide the latest service manuals, technical bulletins and data to technicians on a single disc, rather than using batches and multiple floppies. Library, and health care management as well as government agency and general business personnel can use the compact, inexpensive and reliable technology (after ensuring that they understand the limitations) for data archiving and still have data readily available.

When recordable CD was first introduced, many thought it would be ideal for COLD applications because of its low cost, ease of copying, reusability and archival nature. They overlooked the fact that the CD's slow access speed often makes queries unacceptably slow. The sequential nature of CD-ROM (similar to tape) makes it unlikely that the problem can be solved for several product generations.

## CD-Recording Pros

Even with its limitations, however, there are strong reasons for implementing a recordable CD program, including:

- It's inexpensive. Blank discs cost under

\$25 and can store up to 650MB.

- It's relatively fast. Users can produce a 650MB disc in about 15 minutes (using a 4X recorder).
- With multi-session recorders, users can add data to the disc until it is full and are no longer limited to one session per disc.
- CD-R media is compatible with any of the millions of CD players that are installed in systems today. This is ideal if firms want to distribute multiple copies of data, images or information because, regardless of the platform, recipients can use the disc.

## CD Recorder Cons

- Users need a fast computer with a very high-capacity hard disk and need to be thoroughly familiar with the mastering software.
- Pre-mastering data in preparation for recording takes time, once the recording session is started it can't be stopped. If users are producing 3 to 25 copies of the same disc, the recording time per disc is the same for each copy. There are no shortcuts. Formating large amounts of information on the fly requires very large amounts of assignable memory. If the recorder does not have sufficient caching, thermal recalibration of the hard drive will cause a problem.

- CD-RDM drives are slow. Average access time is up to 1,000ms (.1 second) and the data transfer rate is only 600Kbps, even in the fastest drives.

- While multisection is possible, in many cases, it isn't practical since with each session users have to add format data, headers and FAT (table of contents information) which eat up storage capacity.

## Rewritable Multifunction

The key benefit of multifunction optical drives and platforms is that, depending upon the underlying technology, they provide:

- true WORM and rewritable capabilities
- OCW and rewritable capabilities
- true WORM, OCW and rewritable capabilities.

Documents with short-term value, such as draft correspondence and memos, can be temporarily stored on rewritable media. Then, vital documents and reports that must be retained can be permanently archived on high-security, write-once optical disks.

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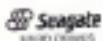
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# COVER STORY

means that the drives can read and write data with new high-capacity media as well as older-generation data cartridges. However, because drives and printers manufacturers often add their own interface and implementation software, the standards do not ensure that media can be interchanged between hardware platforms.

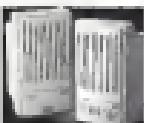
As mentioned earlier, MO media combines laser storage with magnetic technology. Digital information is stored in the form of magnetic flux directions, rather than pits or bumps. Because the magnetic MO media uses data in a form similar to the techniques used on hard drives, data can be erased and even written.

A "write" laser prepares the media and electromagnets change the magnetic orientation of the data spot. The same laser, at a lower power, reads the magnetic information. To overwrite or erase data files, the magnetic flux is reoriented in one pass. In the second pass, the message is verified and new data is written in the third pass.

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**COVER STORY**

### Phase-Change Rewritable

With the phase-change direct overwrite approach, laser light converts microscopic points on the disk from a ductile, amorphous state to a reflective crystalline state. The laser beam reads the difference in reflectivity between the crystalline and amorphous areas as positive or negative and translates the information into data one bit at a time.

To overwrite information, a more powerful beam rewrites the process, changing spots back to an amorphous state. Called **Rewriting**, this process allows the phase-change media to switch directly from amorphous to crystalline and back again hundreds of thousands of times.

### Application Issues

At first, the several million write/erase cycles offered by MO may appear to be a significant advantage over the hundreds of thousands offered by phase-change. However, one medium rewrites one read/write cycle every 5 minutes for nearly ten years. As a result, the read/write cycle performance of both technologies exceeds the demands of even the most demanding applications.

To solve the reliability questions that have been raised, quality disk manufacturers now offer sophisticated detector circuits to alleviate questionable sectors long before any problems with erase cycles are encountered.

End users are quickly learning that ANSI/SID standardization does not ensure either compatibility or high performance. For example, a media manufacturer may produce media that is completely compliant and still have a disk that is incompatible with other ANSI/SID standardized media or certain drives. In other words, two compliant disks can use completely incompatible technologies to perform their functions.

Because of these conflicts, today's sophisticated users are more concerned with ensuring that there are multiple sources for the media and that it meets their capacity and performance needs.

Today's users are also demanding multiformat peripherals.

We already have MO drives that will carry out true WORM, CCW and rewritable functions. Since phase-change technology uses basically the same read method as CD-ROM and WORM systems, industry pundits also predict that it will be possible to build higher-capacity rewritable CD drives that use phase-change technology.

A new dual-functionality PWD/CD-ROM drive already available that not only reads and provides direct overwrite capabilities for large-capacity, phase-change optical disks, it also reads CD-ROMs, audio CDs and photo CDs at four times the speed of standard CD-ROM readers.

Other advancements include the development of even smaller optical read/write heads so access times can continue to decrease. In addition, higher-capacity true WORM, CCW and rewritable media is being developed to meet the insatiable storage demands of users.

Rather than force WORM technology into retirement, erasable and multifunction technologies have dramatically enhanced the opportunities for write-once media. Organizations that purchase multifunction systems mainly for their durability are increasingly finding that most of their applications require secure, reliable storage and retrieval rather than short-term storage of information that is soon discarded. □

**About the author:** *Malcolm R. Cook is a product manager for Bell + Howell Ltd.*

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## new products

### Fujitsu builds smallest MO for latest Mac PowerBooks

Fujitsu Canada announced the world's smallest magnetic optical storage device for use in Apple Computer's latest PowerBook laptops. Fujitsu's PowerBook DynaMO 230 is 17mm high, 250 gm and stores 230mb on 3.2" optical disks. It can read and write 128mb media. There is a separate connector to connect it to Apple's PowerBook Expansion Bay for use in the slot normally reserved for the floppy drive on PowerBooks 190 and 3300 series laptops. There is also an Enhanced IDE interface for connecting to PCs. It transfers up to 1.6mb/sec with seek time of 6ms. Price is \$649. Fujitsu 905-402-3454.

### Virtual Guitars maker changes name

Ahead Builders of the Virtual Guitars peripheral is changing its name to Virtual Music Entertainment, Inc.

The popularity of the device led to the introduction of a CD-ROM Quest for Frame featuring the rock group Aerosmith. At the EB trade show in Los Angeles the next generation device - Virtual Pack or VPack was also introduced. The VPack fits in either left or right hand and the user simply strums it against any solid surface - tennis racket, tablecloth, broom, baseball bat, or belt buckle. The VPack senses the resistance, uses internal switching technology and translates the signal into guitar sounds that are played through the computer. SRP is US\$69.95. Request Mac or multimedia PC. Virtual Music 617-271-0999.

### Best of both worlds on the 'Net

ValueNet Corporation of San Francisco, CA has Hypertextage, software that automatically adjusts the appearance of a Web-site to suit the browser being used. Web designers no longer have to choose between offering a Netscape Enhanced Site (which looks like post to a PostNet user) or a plain vanilla Web site which doesn't catch anyone's eye.

Hypertextage works by using C code to automatically determine the browser requesting a page and then tailoring HTML files to work well with that browser.

Supported browsers include: Netscape 1.x, 2.x, 3.x, 4.x, Mozilla, AOL, Lynx and Prodigy. Browser characteristics are stored in tables which are easily configurable at the server site. ValueNet: <http://www.valuenet.com> 707-833-6042.

### Object database for the Web

On TECHNOLOGY is releasing On Web a server development and management tool for use on the Internet's World Wide Web (WWW). Users can utilize the object-oriented program to process complex and voluminous multimedia data stored on the Web. It offers database features such as large capacity data storage, ability for users on different parts of the network to share data, system reliability and ease of maintenance. On TECHNOLOGY 415-842-1900.

### ClarisImpact 2.0 ships

ClarisImpact a cross platform charting and diagramming program for Power Mac, Mac, Windows 3.x and Windows 95 is shipping. Canada wide. ClarisImpact produces organizational, flow, hierarchies, total quality management and other charts. It also does time lines, calendars and fractal graphics.

It can transfer files across platforms with ease. SRP is \$199 with upgrades from version 1 priced at \$69.

Claris 1-800-363-4073.

### NEBS updates PageMagic for BTP

NEBS Business Forms enhanced PageMagic 2.0, a Windows based BTP package. PageMagic 2.0 has a new interface, more than 170 templates, 30 new features and easier file handling. Also included is PagePrint which guides users through their document design. It also supports OLE 2, has 33 TrueType fonts, over 200 logos and has a feature called Clipart Browser. NEBS 1-800-461-3573. SRP is \$89.95 and it comes with 30 days technical support. A free upgrade is available to those who bought version 1 in the last 30 days.

### Seeing pelletsets in VR

World Builder is using virtual reality software to simulate a 3-D model of real world work place hazards on the PC. The model is a walk-through virtual building

showing offices, conference rooms, restrooms, labs, lounges and a cafeteria. It shows pollutants that cause eye, nose, ear, throat irritation, headache, fatigue, increased heart rate, nausea, dizziness and dermatitis and other symptoms. The program is designed to reduce lost work days and cut costs in companies. World Builder 718-421-3360.

### DynaDisk has dual function rewritable optical/CD-ROM system

DynaTek Automation Systems Inc. announced the DynaDisk PCID450, a combination 650mb rewritable optical drive and quad-speed CD-ROM drive in a single unit. The unit includes external drive, software for Windows or Mac, cables and blank disk. It comes with a 1 year warranty and will be supported anywhere in North America. The 650mb disk costs \$80 and has a shelf life of 30 years and rewriteable capability of over 300,000 cycles. The laser detects whether a disk is a CD-ROM or rewritable disk and uses the right laser strength for that disk. SRP is \$1,399. DynaTek 1-800-481-8855.

### Pleasanet ships optical, CD-ROM system

Pleasanet Data is shipping a new PDI/CD drive. It reads and writes to 650mb optical disks at a speed of 870kb/sec. CD-ROM read speed is 4x. Price is US\$399 for the internal version, US\$499 external, media is US\$39. Both units have SCSI-2 interface and work with Mac and Windows and OS/2 systems. Pleasanet uses a microdrive mechanism that is simpler and faster than 3-platter magnetic-optical systems. Pleasanet 1-800-445-9400. Canadian distributor, Bell+Howell Ltd. 905-450-6305.

### ViewSonic multimedia monitor

ViewSonic Corp. announced the ViewSonic 17EA multimedia monitor. It features resolutions of 1,024 x 768, 1,280 x 1,024 with 85Hz refresh rate, 0.35 arc pitch and lower shadow mask. Speakers are built-in along with six-motion controls, anti-static and anti-glare protective coatings. Available for Mac and PCs. It has a SRP of US\$799. ViewSonic 909-369-3176.

# Printer Vendors Speculate on Future Trends

By Edward Tropeano

**C**olour and networking are the two factors that are motivating the corporate printer market as we head into 1996. Dot matrix impact printing has truly flattened, becoming a specialised product for general applications. While it is still an challenging laser technology in presentation, because of its efficiency with colour, adopt is the printer market's fastest growing segment.

Evans Research Corporation (ERC) latest report on the printer market in Canada shows growth based primarily on the demand for colour output. In 1993, colour accounted for 31% of printer sales. For 1994, Bill Fourcast, ERC's senior printer analyst, predicts the proportion will rise to 38.6% and he expects

colour printers to represent more than one-half of all printer shipments in 1996. Laser became the dominant colour technology last year with a 34.7% share. Fourcast projects that inkjet will represent an even higher proportion of colour sales through 1996. High-end colour lasers with speeds greater than 12 pages per minute will show a significant growth as well. The low end laser is declining by 5% to 10% as inkjets produce better quality, higher speeds and colour.

The printer market as a whole continues to grow. Eighty-one printers are sold for every 100 PCs. APC Solutions and Technologies, printer industry consultants, show that 50% of all printers will be attached to a network by 1996.

Here's how some of Canada's major printer companies view the trends in the marketplace:

## Apple

Apple Canada Inc. has always had a significant share of the printer marketplace where Apple computers are installed. Because its distribution channels haven't encompassed the other platforms, it has lagged in the Windows and Unix world. But its latest high-end product, the Apple Colour LaserWriter 12/400 PS is a colour laser printer for workgroups composed of any combination of Apple, Windows and Unix computer systems.

(Continued on page 23)

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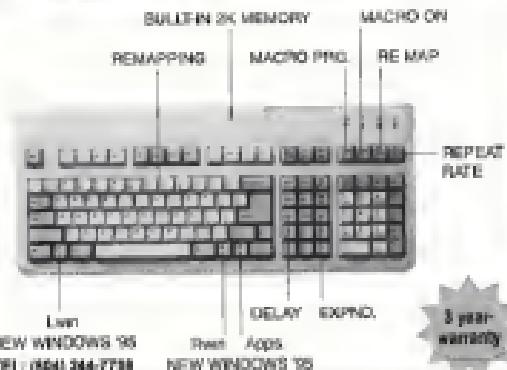
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**FAXBACK DOCUMENT NO. 154.** The Scribe 1.3 GB is the industry's first optical drive. It can be used as both a hard disk replacement and an on-line archiving system. Each 5.25" cartridge holds 1.3 GB of data, and boasts a 30-year shelf life. It is ideal for data-intensive applications such as graphics, CAD/CAM, multimedia or data archiving.



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## The Latest Printers

• Epson recently announced the availability of the EPSON Color IIx, Stylus Color II, Stylus Photo and Stylus Pro XL color printers.

• Epson Stylus Color IIx, 3-color "Photo Quality" ink jet printer, separate BW cartridge, 360 dpi, 2.6 pages/minute, Windows compatible and fully compliant with Windows 95 Plug and Play specifications. 3 year warranty SRP \$220, street price \$199.

• Epson Stylus Color II plus paper 720 x 720 dpi "Photo-Quality" colour ink jet, Mac and Windows compatible, also fully compliant with Windows 95 Plug and Play specifications. SRP \$199, street price \$169.

• Epson Stylus Pro, 720 x 720 dpi, letter size images with registration and crop marks, uses a piezoelectric printhead for dots 25% smaller than original Stylus color printer. Has 100 sheet paper tray, works with Windows and Macs. SRP \$1,690.

• Epson Stylus Pro XL, 720 x 720 dpi 11 x 17 images with registration and crop marks, uses a piezoelectric printhead for dots 25% smaller than original Stylus color printer. Has 100 sheet paper tray, works with Windows and Macs. SRP \$1,690 2 year warranty Contact Epson 800-289-3779 x30000

• Brother HL-630: 6 ppm RAM expandable to 2 mb, 300 dpi, 6 ports, TN-100KT cartridge prints 5,000 pages at 5% coverage, 8,000 pages. If economy mode is used, can double as Mac QuickDraw printer, drum needs replacement after 6 toners.

• Brother HL-660 series, 600 dpi, straight paper path, 6 ppm, 2 mb RAM expandable to 10 mb, Mac compatible with AppleTalk connector, PostScript Level 2 emulation optional, 1 year warranty, consumable name as HL-630.

(Continued on page 26)

## Printer Vendors Speculate on Future Trends

*(Continued from page 23)*

"With no large sized organizations are consolidating their print shops into a single networked printer," says Stan Ossana, product manager for mid to high-end printer systems at Apple Canada.

Since more people are now using color monitors, they want to match what they see on the screen in their output. In the past, Ossana says, color couldn't penetrate the higher end of the market because it was costly and expensive to get colour that could be shared and still look terrific. People are more sensitive to how colour turns out than they are to black and white.

"If you have a picture of fruit, people would know if the colour of an orange was off the mark," he explains. So colour rendering has to be consistent.

With new printing techniques the cost of this accuracy has come down a lot and business productivity increases. When it was costly, organizations tended to ration the use of the colour printing, saving it mainly for external use. At a lower cost, more colour can be used internally in an organization for spreadsheets and to highlight important issues in communications.

### Epson

Epson Canada Limited is also gearing towards colour with its large format high resolution piezoelectric inkjet printers. Even at higher resolution the Epson inkjet products are designed to be more compact and with more features at a lower cost.

"Lower printers are finding slowly and inkjets becoming more predominant for the business user," says Helene Marcus, Epson Canada Limited marketing Communications manager. "For presentation people don't care about speed. Since they are not making a great amount of copies, they care about quality."

Dot matrix remains a viable vertical market for Epson but with a need to be more versatile and faster than ever. Helene Marcus says dot matrix can never be replaced where you still need the impact on the page to print multiple part forms.

### Hewlett-Packard

Ralph McDonald, manager of hard copy products for Hewlett-Packard Canada Limited, differentiates between two types of printer networks. At the local area network level, desktop printers don't need the high volume

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## The Latest Printers

(Continued from page 38)

**Brother HL-1200 series features** 1200 dpi, straight paper path, 800 sheet paper tray + 150 sheet multi-purpose tray, 12 ppm, uses HP4 toner cartridge (EP-ED). Non-compatible with adapter card from 3rd party, optional duplexer, 2.0 mb RAM expandable to 26 mb with standard 72 pin SIMMs, 6 mb RAM required for 600 dpi PostScript output, Adobe Level 2 emulation, 32 MHz RISC processor, uses APT (advanced photobase technology) to enhance photo and HPG (high resolution control) to get total resolutions of 2400 x 600 dpi, has PCL/MQA slot for both RAM or H/D 2 year warranty, 6,000 pages @ 5% coverage from 1 toner cartridge or 10,000 pages using economy mode.  
**Brother International Corp. (Canada), (514) 685-0630**

**Lexmark Optima LX 1200** dpi, 16 ppm, 300 dpi or 600 dpi prints at 12 ppm while 1200 dpi outputs at 8 ppm. SRP \$2,999 with 4 mb RAM and 600 page bin PostScript Level 2 and enhanced PCL 3 emulation, Hard drive and duplexer option, upgrade to 32 mb RAM, SmartSwitch across PostScript or PCL, and switches automatically. Gamma prints 1,000 pages at 5% coverage, duty cycle rated for 75,000 pages per month. One year warranty.

**Lexmark WinWriter 560c** has both color and B/W cartridges on hand so no swapping is required, true blacks not mixed inks, 2-4 minutes for color output, 3 ppm black draft mode, 2 ppm black letter quality mode, 600x300 dpi, handles letter, legal, envelopes, labels and custom papers (- 3" x 6" to 9" x 14.5" width x height), 150 sheet input tray, 15 envelope capacity Energy Star compliant, ink saver mode 437 x 289 x 297 mm or 17.7" w x 10.6 d x 11.7 h, 9.13 lbs (4.4 kg). Consumables, B/W 1,000 pages @ 5% coverage, color 200 pages @ 10%. Two year warranty. Street price @ \$829 comes with Corel Draw 3 CD-ROM. Cost per page in color averages 27 cents and 4 cents in B/W.

**Lexmark Medley** is a color printer, plain paper fax, scanner and copier all-in-one. Color ink jet printer, B/W 8 ppm, takes 2.5 to 7 minutes to print in color. 600 x 300 dpi with PCL/T in B/W, 300 x 300 in color, outputs 16 million colors or 256 gray scales, 150 sheet paper, handles legal letter, envelopes, transparencies, labels, stickers, index cards, 12 TrueType and 2 DOS fonts. Scanner rated at 5 ppm, 300 x 300 dpi, 256 gray scale. Plain Paper Fax has handset, auto/document feeder has 20 pages, 8 ppm, 14.4 kbps transmission, send resolution super fine is 200 x 300, fax is 200 x 100 and standard is 200 x 96 dpi, 64 speed dial numbers, 14 one touch functions. Fax has 60 page memory should the unit run dry in paper run out and it is expandable to 256 pages. Memory allows other functions to work when fax is snoozing. Auto-toset switch built in. Medley fax and fax have 2 handsets FAXkeynergy software and multitasking OS firmware allows user to view various documents, receive fax from PC, multiple phone books and remote status reports. Copier copies at 2 ppm, 300 x 300 dpi at 64 gray levels, 99 copies central control, 1 year warranty, black ink cartridge has life of 1,000 pages at 5% coverage, color cartridge has life of 200 pages at 15% coverage. SRP for Medley 4xx is \$1,599, street price is \$1,479 and it comes with color and B/W cartridges, handset and battery backup to keep faxes in memory should power go down. Medley 4c \$1,539, street \$1,399, has B/W and color cartridges and Medley 4x \$1,539, street \$1,399 comes with handset. Cost per page is 3 cents in B/W and 18 cents in color. Contact: Lexmark 800-250-5535

**Tektronix Phaser 340**, 32 MHz RISC processor, 4 ppm, full color, uses plain paper low cost about 4 cents for B/W and 16 for color, uses easy and clean to replace solid ink sticks good for about 3,000 pages. 800x300 Adobe PostScript Level 2, with options Ethernet, token ring, LocalTalk/Serial, supports Macs, PCs, UNIX, under US\$1,195. Energy Star compliant. Contact: 800-494-8886

(Continued on page 38)

printing capacities of departmental network printers. These smaller workgroups are looking for faster print speed along with network connectivity capabilities but at a low cost.

Just as colour migrated from the small office, home office (SOHO) to the corporate level, he sees multi-functional equipment moving up the ladder. But the multi-directional printout at the corporate level is going to be more than a printer, modems/fax machine, photocopyer and scanner. He sees in incorporating all the capabilities that come from being on a network, including distribution and storage.

"Using the network more as the backbone of the system, the printer becomes the logical connector of intelligent devices on the network," he says. "We call this recipient printing. It allows the receiver to print, store, and edit documents as they need to."

Printers and networks will integrate through the printer software so the user can choose which printer to send the job to on the network. The printer becomes a quick-e-mail system with the sender sending the document directly to the recipient's printer. These printer networks are transparent so there is no need for codes or knowledge of paths.

Colour is still emerging, McNiel sees corporations are starting to invest in the hardware, but they are still sorting through the strategies of how to implement colour. Certain parts of the organization, specifically sales and marketing are moving towards colour quite rapidly, while others are moving more cautiously.

"Colour is becoming the expectation rather than the exception," he says.

McNiel thinks inkjet printers will be the driving force that makes colour pervasive in corporate environments. While laser has its benefits, inkjet prints colour at a lower price. He believes inkjet will move to the higher end and predicts that within a very few months even professional design and printing concerns and computer aided drawing will use inkjet.

"Having a device that can do large format printing with photo realism capability is really exciting for them," he says. "There will be tremendous opportunity for excellent working with Hewlett-Packard and its customers to provide solutions and consulting in areas the technology never existed before."

(Continued on page 38)

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# Printer Vendors Speculate on Future Trends

(Continued from page 27)

## Lexmark

Sandy Corlett, vice president, printer marketing, Lexmark Canada Inc., also views the attaching of printers to the network as the overriding trend in his industry. Speed and print quality will still be driving forces but he thinks manufacturers will have to start building network management tools directly into the printers to meet the new market demands.

The emergence from colour technology where colour basically counts first is also driving down the cost of colour on laser printers. Some executive corporate users, while they do the bulk of their printing on the network, will want a personal printer in their office for colour occasions. "We call this the calendar market."

Lexmark's newest product is a high-end network colour laser with continuous tone that gives near photographic quality at a price close to \$10,000. So, for individual users doing departmental presentations, the indulgence of a \$300 inkjet doesn't seem out of hand. "It's the first trend we have seen driven from the home rather than the other way around," Corlett says.

The shipping road is the market he sees for dot matrix. Bills of lading, inventory control, tampered documents that must come back with a signature are all applications that lend themselves to a dot matrix printer. The Lexmark heavy-duty dot matrix printers are designed to operate in this stand-alone environment.

## Xerox

A lot of what people used to do on their copiers, Xerox Canada has determined they are now doing on their laser printers. They also found out that if there was more opportunity, corporate Canada would do even more on the printer. To meet the challenge Xerox is adding finishing and paper handling options, like the ability to collate and staple copies, to its new X family of high-end printers.

Jocelyn Eisenberg, desktop printers marketing manager for Xerox Canada cautions resellers to prepare for the explosive growth in the colour laser market.

"I am going to equate it to when desktop publishing became an important element," she says. "You're vying for everybody's attention. Everybody's trying to sell something, even if it's my proposal's better than your proposal."

People taking their work home to complete it on their home computers and print it in colour as the night wanes colour capability when they come back to the office. Price is also encouraging colour. In 1994 the average price of a colour laser printer was \$40,000 or \$50,000. With a range of colour laser products now at between \$7000 and \$12,000 it is a lot more affordable. "It's no longer one per corporation," Jocelyn Eisenberg says.

## Rover

Stuart Petersen, sales and marketing coordinator for Canadian owned Rover Printers, well known for its early dot matrix printers, is observing a decentralization in the printing process. With Windows for

(Continued on page 29)

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## The Latest Printers

*(Continued from page 20)*

- **Epson BJ-30** small size printer (300 x 157.6 x 57 mm), two line print capability gives it a 277 cps or 3.5 ppm speed. 360 x 360 dpi can be smoothed to 720 x 360. Has 4 print modes - fine, high quality, normal and economy. SRP \$449.

- **Canon BJ-C70** uses two ink tanks, one for B&W and the other for color; new quick-drying non-toxic inks have bright colors and rich blacks with better resistance to fading and moisture. Wide cartridge prints two lines at a time. The BJ-C70 can print on envelopes, transparencies, backprint film and high gloss film. Auto feeder holds 20 sheets and a paper thickness detector eliminated the need for a paper selection lever. Has universal power adapter for worldwide use, rechargeable nickel metal hydride battery for up to 180 pages SRP \$899, weighs 1.4 kg, measures 350 x 157.6 x 57 mm.

Contact Canon Canada (905) T95-2034

- **GEMS magicolor CX** laser printer, is a 600 x 600 dpi color laser that can print in color at 3.4 ppm and 12 ppm in B&W. It is networkable with Ethernet or Token Ring connectors to NetWare, TCP/IP, EtherTalk and LanMan/LanServer. There is GEMS ColorSmooth which uses frequency modulation screening for accurate colors and smooth edges and GEMS QCOLOR color management tools for automatic or custom color control. It has a \$1,469 option to turn it into color copier that does not require a host computer to operate, the option has a scanner that plugs into the SCSI port on the printer. Also available is a sheet feeder for \$799 and transparency unit for \$699. The magicolor CX comes with 32 mb RAM (expendable to 64 mb plus internal HD), it has 38 PostScript fonts, 20 PCL fonts. SRP for the magicolor is US\$17,995. The CX is for high end photo realistic output. Less expensive color printer is available in the LX which comes with 12 mb RAM for 600 x 600 B&W output or 300 x 300 color, another 12 mb RAM will

give 600 x 600 color output. SRP is US\$4,999. Contact QMS 800-823-2886

- **Raven LS-8** 1200 dpi when used in Windows mode with edge enhancement technology and photo enhancement technology supports client/server operations under Windows for Networks 3.11, 8 ppm, bi-directional parallel port provides print status to Windows users. Toner saving mode, has RAM compression which can print full page PC-L4 pictures with 512 kb of RAM. Energy Star compliant. 5" wide footprint has reliable toner process unit, toner KOP-459 has life of 2,000 pages at 4% coverage, process unit KOP-EPS has life of 15,000 pages. Contact Serviceworks Distributions (804) 273-4455

- **Genicom 7812** SRP \$2,415 street \$1850, uses HP toner cartridge, 12 ppm, 600 dpi with HRC (high resolution control) 2mb RAM expandable to 28 mb. 150 sheet multi-purpose paper tray, 500 sheet second paper tray, duty cycle 20,000 pages/month, takes PCMCIA III cards, auto port and emulation switching for networking, emulates Adobe PostScript Level 2, Epson FX-850, HP PC/USE (LaserJet 4), HP-GL, Uses HP LJ4 toner (EP-E) Energy Star compliant and it even takes IBM TX/IX cards. Contact Genicom Canada (905) 882-2500

- **HP LaserJet 4L** SRP \$855, 600 x 600 dpi, uses HP's new PrintSmart set of technologies designed to give Windows users advanced features which save time with quicker print speeds, uses no wait fuser technology to get page out in just 20 seconds and can print faster than rated engine speed, cost page is less than 2 cents and EconoMode brings it down to 1 cent per conserving toner, has 4,000 page monthly duty cycle, sets up out of the box in about 15 minutes, one-button operation, on-screen help and print status monitor, plug and play compatible with Windows 95, Energy Star certified. Hewlett-Packard 800-357-3887

## Printer Vendors Speculate on Future Trends

*(Continued from page 20)*

Workgroups and Windows 95 there is a trend to sharing among fewer people, rather than many users all accessing a large format, high speed network printer. The new line of Raven printers promises that trend and follows that market. Susan Pearce also sees more personal printers in corporate use.

"People like colour and really want to make colour presentations," Pearce says while he agrees inkjet offers the best colour for the cost, he is looking ahead to what he calls the next generation of colour printer—dye sublimation. He thinks the output of dye sublimation will be closer to photo realism.

He thinks the next year or two will be a turning point away from inkjet. "The cost per page is a huge factor in corporations and we believe dot matrix and laser are a lot cheaper to run than inkjet," Stuart Pearson says.

Raven still finds a market for its document products, but a different one. Its wide carriage products do well where economies of scale in the printing of invoices, running reports, and labels, warrant heavy usage.

### Brother

Henry Davileens, national sales director, printer products group for Brother International Corp. (Canada) Ltd. says, "there is no doubt that the most attractive and professional looking documents are printed on laser printers, and the desire from users for this type of output will always be demanded." This leaves us with the challenge of developing this technology faster, easier, even more attractive and needless to say, cost efficient. The demand for laser printer technology will be far greater once these challenges have been delivered and will increase in popularity in the coming years. Therefore users will soon enjoy even greater versatility in laser printer and the selection for a printer will not be as difficult as it is today. The question for users remains - will it be ink jet or laser? □

**About the author:** Edward Trzepizur is a freelance writer living in Toronto, Ontario.

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Approximately 800 different products from thirty-makers are distributed through ADAM's warehouse and sales office located in Markham, Ontario. Exclusive and non-exclusive arrangements include such well known supplier names as Compaq, Comtex, Dextra, Focal Technologies, Fujitsu, GGC Technologies, IBM, Impact, Laptops, MacUSA, Magus, Maxx Mac, Phillips, Quantum, Samsung, Seagate, SyQuest, Toshiba, and Unisys. ADAM's positioning makes it an ideal distributor to carry the highly integrated Macintosh clones and many custom computer products.

**ADI Systems Inc.**

3317 Raymond Ave., San Jose, CA 95113  
Tel: (408) 944-8300

ADI is marketing new digital motion notebooks, CD ROM drives and 64-bit PCI graphics accelerators and 16-bit stereo sound cards.

**Advantec Interface Electronic Inc.**

48 Kinsmen Dr., Mississauga, Ont. L5R 2T7  
Tel: (905) 479-0447 Fax: (905) 478-4316

A PIC microcontroller/door controller of high performance PC systems, notebooks and peripherals. Leading product lines include Rapport, Micro computers, Verbatim, Optipak insertion and Passante optical storage products.

Branch office:

Richmond, B.C.: Tel: (604) 276-4345 Fax: (604) 278-9937

**Advance Metal Computer**

37 Kinsmen Driv., Unit C, Mississauga, Ont. L5R 2T7  
Tel/Fax: (905) 479-2274  
Ext: (905) 479-8840 Fax: (905) 479-8812

An operational manufacturer of peripheral cascade cases, power supplies and keyboards and a Canadian distributor of a variety of imported computer parts.

**Agfa Division**

3000 Agfa Inc., 207 Bedford Road, Etobicoke, Ont. M9W 1C8  
Tel: (905) 247-3361 ext: 4070 Fax: (416) 241-3405

Agfa is leading worldwide manufacturer of imaging products and systems. Through its Graphic Systems business group, Agfa markets a range of electronics and photomechanical processes, imaging systems and supplies in conjunction with the graphic arts printing and publishing industries. Products include a wide range of desktop scanners for home/office, publishing and graphics applications, signal converters and the QuadFront digital processor. Some of Agfa's leading printing scanners are the entry-level Quadline, the new Quadline II and the mid-range Agfa II.

**Alaris, Inc.**

47233 Forest Hill Dr., Burnetts, Ont. N4T 1E8  
Tel: (416) 747-1000

Alaris is marketing membrane-based value cards, computer systems, monitors and NetGen 586/4 CPU.

**Altion Inc.**

252 Andor St., Unit 34, Markham, Ont. L3R 3J7  
Tel: (905) 473-3359

Altion is distributing ATI video, audio, networking, and communication products. New MAG conversion modules have been added and are available at a variety of resellers with ATI reseller partners.

**Amitek**

37 City Gates Drive, Suite 310, Mississauga, Ont. L5R 2N5  
Tel: (905) 472-3837 Fax: (416) 470-4226

Amitek is a global provider of quality products and services to the enterprise computing marketplace.

**AND Office Automation**

310 38th Ave. East, Vancouver, B.C.  
Tel: (604) 472-8300 Fax: (604) 474-8300

Is an office automation franchise based in Vancouver B.C. AND sets up and trains potential computer users across key demographic locations around the country. Each computer centre is a family-type environment run by local entrepreneurs.

AND provides hardware and software solutions for personal computing, telephone and institutional installations through its 15 branches across Canada.

**Artisoft Inc.**

19 Centre Court, Unit 200, Burlington, Ont. L7R 4L2  
Tel: (416) 273-8800 Fax: (416) 273-6602

LAZARUS Data Direct Artisoft is the largest and sole marketing relations for small and growing businesses.

**Asia-Link Computer Inc.**

43A Mid Millet St. Unit 10, Richmond Hill, Ont. L4B 1H2  
Tel/Fax: (905) 461-8079

Ext: (905) 234-2102 Fax: (905) 234-6971

A distributor of computer components and peripherals also custom-built systems to specific configurations. Distributors to dealers, resellers, OEMs across Canada with major concentrations in Central Canada and Maritime

**AST Canada Inc.**

337 Belmont Blvd., Mississauga, Ont. L5R 3G7  
Tel: (905) 267-1018 Fax: (905) 267-0546

Distributes, maintains and services full line of high performance desktop, server, and notebook computers through distributors and direct dealers across Canada. Its broad user base include the three Accents, Frontline, Marlin and Advantage families. AST Canada is a subsidiary of AST Research.

**AVS Technologies Inc.**

2100 Theta Canada Way, Mississauga, Ont. L5P 2W4  
Tel: (905) 469-5312 Fax: (905) 469-5307

A Canadian computer accessories supplier selling to resellers, distributors and wholesalers. The line carried includes a number of well known brand names in the electronic industry. AVS' main focus is in the computer industry with DOS data storage media. TDK is the world's leading manufacturer of magnetic and optical media. Branch offices:

Toronto, Ont. Tel: (905) 467-0304 Fax: (905) 467-0305  
Vancouver, B.C. Tel: (604) 267-7967 Fax: (604) 461-0796

**B****Beamscope Electronic Entertainment**

35 Avenue Central, Scarborough, Ont. M1K 1C2  
Tel: (416) 295-0000  
Fax: (416) 295-3789

Beamscope is a national distributor of software and hardware products for the small office/home office market. These products include station master educational software, entertainment software, SCSI products, PCs, printers, multimedia speakers, CD-ROM hardware and software.

**Blade Marketing**

311 East Park Driv., Unit 1, Markham, Ont. L3R 1W2  
Tel: (905) 477-7322 Fax: (905) 477-3812

To be included in the Sourcing Directory, please fax your company name, address, phone number, fax number and company profile to:

CCW Sourcing Directory  
Fax: (604) 739-3589

Publisher reserves right to list or delete any company for any reason.

# sourcing directory

Distributor of POS point-of-sale drivers, customer displays, keyboards, dot matrix and thermal printers, bar code and card readers in the POS market across Canada.  
Brand/Offices:  
Kanata Del. Tel: (613) 732-7411 Fax: (613) 732-3613  
Markham Del. Tel: (905) 433-0416 Fax: (905) 433-0423

## B.I.S. Information Systems

#607 124 York Peacock Street, Vancouver, B.C. V6A 1T7  
Tel/Fax: (604) 688-8526 / 243-0196

Distributor of a complete line of Chinese and Japanese software PC and Macintosh processors, English-Chinese translation, English-Chinese dictionary, language translator and Chinese CD-ROM tools.

## BOCA Research Inc.

377 ResearchScope, P.O. Box 335, Etobicoke A. Ontario  
Ont. M9C 1S6  
Tel/Fax: (416) 293-2598 Fax: (416) 293-1893

The company's products enhance the performance and increase the functionality of personal computers. They enable personal computers to be linked through local area networks and share hardware, documents and software.

## Brother International Corp.

1 First Floor 100 Bay, Bellfonte East-Dominion, Que. H3B 3M6  
Tel: (514) 492-5100 Fax: (514) 492-1860  
Tel: (514) 493-0660 Fax: (514) 493-0791

A supplier of ink jet and laser printers, fax machines, portable and office copiers and paper presenters and labelling systems. The company's products are sold under name *Brother*.

## BTI Technologies Inc.

2320 Fairview Road, Suite 215, Richmond B.C. V6V 1R9  
Tel: (604) 273-5100 Fax: (604) 273-1860  
Order: 1-800-317-4538

A distributor of Multi-Express Business Systems Server Software 8000 an enhanced accounting, point-of-sale, financial and sales transaction processing and communications.

## Bytwid's D&D Solutions Inc.

5000 Boulgogne-O., Montreal, QC H3J 1A9  
Tel: (514) 325-0510 Fax: (514) 325-6664

Bytwid's D&D is a distributor of superior quality, storage management, document imaging/printers and display solutions.

Branch offices:

Havre-Saint-Pierre, QC: Tel: (418) 728-9416 Fax: (418) 729-1514  
Trois-Rivières, QC: Tel: (450) 768-0337 Fax: (450) 767-3376

## C

## Canadian Memory Products Ltd.

Suite 250, 109-11 Sheldene Way, Richmond B.C. V6A 2B9  
Tel: (604) 279-0037 Fax: (604) 279-0026

Suppliers of high quality memory modules for all types of computers have personal notebooks and laptops. The only West Coast-based distributor specializing in Memory Upgrade Products. Canadian Memory Products is now serving over 2000 clients.

## Centel Group Enterprises Inc.

120-1300 Maytree Way, Etobicoke B.C.  
Tel: (416) 776-0100 Fax: (416) 775-2357

A national distributor/wholesaler of microcomputer accessories and office supplies products include power bars,

power control centre, keyboard, cable, data switch, gender changer, DC/AC converter modular data link, disk duplicator, inc., mouse, mouse cables, copy holder, keyboard, memory, power strip, serial and parallel port, monitor arm, server, SCSI, Cleaning kits, computer disk, hard disc cleaner and Centel audio/video accessories.

## Canon Canada Inc.

6390 Davis Road, Mississauga, Ont. L5T 1P7  
Tel/Fax: (905) 273-1121

Tel: (905) 273-1121 Fax: (905) 273-3614

A major distributor of information systems products to dealers and distributors across Canada. Products include bubble jet, color bubble jet and laser printers, image scanners, multifunction PCs, compact disc recorders, notebook PCs, fax machines, bubble jet printers.

## Centre Technologies Inc.

140 Evans Park Dr., Unit 7, Markham, Ont. L3R 3K3  
Tel: (905) 473-0000 Fax: (905) 473-0647

A national distributor of PRUDOC's complete client/server supplies, multi-media and networking products.

## CIMSYS Canada Inc.

87 Pleasant Blvd., Markham, ON L3P 2B7  
Tel: (905) 462-1894

CIMSYS provides software for sales force automation featuring the Action! Plus sales management system. The software integrates database management, word processing, electronic mail, e-mail, real estate, fast/queue order processing, marketing, and inventory. It also uses wireless software package. Full remote diagnostics/communications is available through the Action Studio feature.

## Clarix Canada, Inc.

3 Church St., Ste. #90, Toronto, ON M5E 1M8  
Tel: (416) 361-6123

Clarix is offering ClarifyWorks 4.0 for Windows, the ultimate product for business, home and education users that integrates word processing, spreadsheets, database management and drawing from one application. The Macintosh Pro, an enhanced database for both Mac and Windows users with its small footprint and corporate interface, is also available. ClarixOS9 for Workstation, a streamlined alternative for graphics is also featured.

## Classix Software Systems Inc.

Box 225, 2842 Sharrow Ridge Drive  
Guelph, Ont. N1J 2S2

Tel/Fax: (519) 826-5379  
Tel: (519) 828-5147 Fax: (519) 825-5024  
888 (800) 379-2337

Classix Software Systems Inc. is a national distributor of POS automation equipment, supplying software, hardware and peripherals to dealers coast to coast.

## CompuCast Systems Inc.

200-2540 Main Street, Burnaby, B.C. V5T 1C3  
Tel: (604) 533-6661 Fax: (604) 532-6118

Distributor of multimedia solutions and computer systems.

## Computer Plug Accessories

Unit #2, 25 Andover Rd., North York, Ont. M3A 1B7  
Tel/Fax: 1-800-282-3379

Tel: (416) 499-3360 Fax: (416) 499-4144

One of the Canada's largest importer and distributor of model computer parts and computer accessories. Brand names include TestCraft, SuperDisk and Tasc.

## Computer Accessories Plus

7200 Shear, Mississauga, PQ L5G 4G9

Tel: (905) 273-1860 Fax: (905) 273-2322

Computer Accessories Plus is Canada's leading distributor of computer accessories and multimedia products with over 400 different computer & electronics accessories such as microfloppy drives, plastic storage boxes and electronic surge suppressors, etc.

## Computer Associates Canada Ltd.

1818 Airport Rd., Mississauga, ON L5V 1H8

Tel: (905) 273-6200

Desktop-to-mainframe client/server software is available from Computer Associates.

## Computer Clearance Warehouse

230 Kingwood, Mississauga, B.C.

Tel: (905) 479-3776

Computer Clearance Warehouse imports used and surplus computers, parts, supplies, accessories.

## Comstar Micro Systems Inc.

3170 Mayfield Rd. East, Richmond, B.C. V6V 2B7

Tel: (604) 223-4668 Fax: (604) 229-3819

A manufacturer and distributor of computer equipment and peripherals serving all of Ontario. Service centres are located in Western Canada.

Brand/Offices:

Guelph, Ont. Tel: (519) 243-3386 Fax: (519) 258-6099

## Comtronic Computer Centre

80 Evans Dr., Mississauga, ON L3Z 2W9

Tel: (905) 475-4706

Comtronic Computer is a distributor of broad range and OEM computer systems, peripherals, and components. The company specialized in networking hardware and software from companies such as Apple, Compaq, Dell, Epson, Gateway, Ibm, Lexmark, Microsoft, Novell, Packard Bell, and Toshiba. The Laplink notebook and the Packard Bell multimedia notebooks are available.

## Consort Peripherals

50 Bertrand-George St., Suite 401

Mississauga, Ont. L5J 2C2

Tel: (905) 279-3336 Fax: (905) 279-3364

Founded in 1986, the company sells, designs and builds a comprehensive line of information storage solutions products, including disk drives, tape drives, storage management software and disk array storage systems.

## D

## D-Link Canada

2180 Dickens Dr., Mississauga, ON L5L 1H8

Tel: (905) 274-4329

D-Link is an ISO 9001 manufacturer of networking and interconnecting solutions providers/Internet backbone FDDI, Fast Ethernet, ATM, and 100Base-T hardware.

## Daewoo Electronics Canada Ltd.

179-8880 1st, Mississauga, Ont. L5R 9C3

Tel: (905) 275-3398 Fax: (905) 275-2287

A leading manufacturer of computer monitors and consumer electronic products. Produces high-performance quality monitors ranging from 14 to 21 inches.

## sourcing directory

### Dalton Distribution Inc.

11155 150th Street, Richmond, B.C. V6V 2G3

Tel: (604) 244-9992 Fax: (604) 244-9888

A national distributor of motherboards, add-on cards, floppy disk drives, and monitors serving Ontario and western Canada.

Branched Office:

Markham, Ont. Tel: (416) 499-2999 Fax: (416) 499-4061  
Mississauga, Ont. Tel: (905) 258-6701 Fax: (905) 258-7364

### Datatek Electronics Corp.

8030 100th Street, Unit 103, Mississauga, BC V4V 7Y4  
Tel: (905) 229-3000 Fax: (905) 229-3932

A subsidiary of Datatek Corp., the main business is selling computer accessories manufactured in South Korea, drives & readers, RAM, adapters and system integration. Products range from 14-inch to 15-inch and from 3.5" SVGA with digital controls, low resolution, SIF, EGA, and EGA graphics.

### DATANOME Infosystems

262 178th Street, Coquitlam, B.C. V3B 2K7  
Tel: (604) 254-3384 Fax: (604) 254-9332  
Sell Fax: 3-800-561-5566

Data Infosystems is a CD-ROM multimedia distributor of software for PCs and Macs.

### Digital Equipment of Canada Ltd.

4115 Yonge St., North York, ON M3J 2C7  
Tel: (905) 760-7600

Digital's Internetwork Alpha Server combines the high RISC performance of Rhapsody and the strength of Digital UNIX. 32 Node Networkable, Cacheable SL, Multimedia Systems and Personal Bridges, and the TransServer. Routers also available. Networking products include DECnet 90/100, DECnet Family of TCP/IP and ATM Router/Adapters. Wireless connectivity products, and Multimedia network configurations and management software. Products include InfiniNet Multimedia Bridges, MPX2, Matrix, mirrored client clustering.

### Dynatak Automation Systems Inc.

250 Bannister Rd., Bedford, NS B4B 1G9  
Tel: (902) 422-3000

Dynatak Automation Systems manufactures and distributes RAM, hard disk tape, removable hard disk, tape, tape optical, and CD-ROM disk storage products.

## E

### EMI Data Systems Ltd.

P.O. Box 1010, Guelph, Ont. N1H 6N7  
Tel: (519) 827-3494 Fax: (519) 824-1804

A national distributor of computer, audio, computer related hardware, and peripherals.

Branched offices:

Richmond, B.C. Tel: (604) 220-1024 Fax: (604) 220-2914

Guelph, Ont. Tel: (519) 826-1347 Fax: (519) 826-1373

Edmonton, Alta. Tel: (403) 455-1431 Fax: (403) 455-1427

St. Catharines, Ont. Tel: (519) 747-4300 Fax: (519) 747-3864

Winnipeg, Man. Tel: (204) 648-0201 Fax: (204) 649-0262

### EMPAC Computer Corp.

150 Kierland Crescent, Markham, Ontario, L3R 2T7  
Tel: (905) 460-3888 Fax: (905) 460-3809

Empac is a national distributor and manufacturer of computer systems and peripherals. Empac's head office is

located in Markham, Ontario, with regional offices located in Vancouver and Montreal. Empac distributes a wide selection of broad range computer products. Product line includes the complete line of EMPAC and CTI P/T, Shareit Data and CICA P/TTE, microdrives, Megamax and Goldstar monitors, Quantum tapes drives, American Power Conversion UPS, Starling hard drives, notebooks and printers, Panasonic, TOSHIBA, IBM, 3M, Matsushita and other peripheral products. In addition, Empac also carries many other broad names.

Branched offices:

Vancouver, Que. Tel: (506) 245-8000 Fax: (506) 245-8317  
Edmonton, Alta. Tel: (403) 951-0733 Fax: (403) 951-0737

### EPSON Canada Ltd.

230 85th Street Ave., Mississauga, Ont. L5J 2E7  
Tel: (905) 274-0132 Fax: (905) 274-0179

A wholly-owned subsidiary of Epson America, which is a member affiliate of Seiko Epson Corporation, a global manufacturer of computers, printers, scanners, LCDs, calculators and other high technology instruments. Epson's line of power products, namely computer imaging solutions at the personal and institutional levels. A national imaging products company specializing in the distribution

of dot matrix, laser and ink jet printers, scanners, and personal computers and accessories.

### Exida Electronics Canada Inc.

700 Carlingwood Drive, Ottawa, Ont. K2B 5B9  
Tel: (613) 747-0777

The Exida Electronics Powersystem/Prieger UPS line of 800-16000 VA provide network power management with UPS hardware, specialized software, network compatibility tools, and worldwide service and support.

## F

### Feastech Computer Ltd.

460 123rd Street, Mississauga, Ont. L5J 2P9  
Tel: (905) 274-5800 Fax: (905) 279-0072

A distributor of high performance PCs, computer parts for the PC and Macintosh platforms, multimedia products and top-quality screen filters. Also provides leading edge multimedia technology including MPEG encoding and playback software, video-on-demand, character video capture and communication systems.

Branched offices:

Alberta Tel: (403) 251-4431 Fax: (403) 251-3529

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## Mackie Enterprises Ltd.

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Tel: (604) 270-3386 Fax: (604) 270-2289



## sourcing directory

**IBM Canada Ltd.**  
1980 Keele St., Suite 200, Mississauga, ON L5A 2E7  
Tel: (905) 667-7007  
IBM provides hardware from PCs to mainframes, software from operating systems to application solutions, technology from components to complete systems, and services including software support, education, consulting, and maintenance.

### Ineq Technology Inc.

7880 East Broadmoor, Burnaby, BC V5A 1P9  
Tel: (604) 261-1400 Fax: (604) 261-0309  
381-1111 Tel: (604) 413-0222

Distributor of notebook PCs, workstations, and desktop peripherals and software. Ineq serves all of Canada with toll-free phone service and next day delivery in major cities. Hardware line includes Pentium and 486/386/400 "Name book PCs, PC/AT/XT and parallel port add-in cards, keyboard, CD-RW drives, memory, tape backup, hard drives, floppy drives, ROM and network adapters. Multimedia Video, Audio Capture, Networking, Print-on-Sharing, CPU Stealing, Fax, Windows and DOS/PC/OS/Windows for servers.

### Ingram Micro Inc. (Canada)

230 Bremner Drive, Mississauga, ON L5L 2Z5  
Tel: (905) 749-5400 Fax: (905) 749-6196

Canadian distributor of hardware that makes and distributes more than 30,000 products from more than 400 of the world's top hardware manufacturers and software publishers. Ingram is a wholesale distributor to over than 7,200 Canadian dealers, resellers and value-added partners. Ingram has 14 sales offices in Canada and 12 sales offices in the U.S. Ingram's Mississauga headquarters is a subsidiary of Ingram Micro Inc. of New York City.

Montreal, QC Tel: (514) 284-9395 Fax: (514) 284-2179

Ottawa, Ont Tel: (613) 229-3361 Fax: (613) 229-3377

Gatineau, AB Tel: (403) 293-6321 Fax: (403) 293-6329

Vancouver, B.C. Tel: (604) 536-6337 Fax: (604) 536-6359

### IPC Personal Computers

#### 3D Microsystems

230 Keele Street, Mississauga, ON L5B 1E9

Tel: (905) 479-4037

3D Micro is sourcing its IPC/PC compatible inventory with Intel 486 and Pentium processors. Including multimedia models with Windows 95. All multimedia systems include quad-speed CD-RW (Sony), mouse, 24 bit RGB video, fax/modem and a collection of Microsoft utilities. All Pentium systems include PCI bus with standard 386/486 ISA slots. The systems are well configured and have passed the Microsoft Hardware Compatibility test for Windows 95.

## L

### Landmark Computer Exhibitions, Inc.

14 Mills Avenue, Mississauga, ON L5R 1C3

Tel: (905) 261-7011

Fax: (905) 261-7250

Housing: Landmark is Ontario's largest combined trade & consumer computer exhibition.

### Lapco Marketing

310-3771 Jarrow Road, Port Credit, B.C. H3V 2M5

Tel: (604) 276-7738 Fax: (604) 244-7798

A distributor of computer systems, laptop computers, keyboards, multimedia cases, notebooks and business note-

books. Lapco also carries following products: IBM servers, Ericsson Computer Labs, AT! Trident, Compaq Logic, Sunworkstation, Seeger keyboard, Remate Power, Laptops, Marantz, QUMBERT, Dynex, Fujitsu, Western Digital, Samsung, NEC, Opti, Epson etc.

### Leiser Publishing Group

3915 CAM 229-8459 Fax: (519) 223-4798

Publishers and distributor of entertainment and educational CD-ROM titles.

### LCH Resource Inc.

491 11th/11th Crescent Place, Richmond, B.C.  
Tel: (604) 259-6166

A computer wholesaler of motherboards, video cards, case keyboards

### Logitech Canada, Inc.

7010 Cedars Dr., Suite 6, Kitchener, ON N2L 1Y2  
Tel: (519) 858-2006

Logitech's computer peripherals let a computer take on functions like the telephone, fax, sound, and search like a human. Peripherals include mice and trackballs, sound-card resources, digital cameras, and speakers.

### Loeson Group

83-1511 King St., Kitchener, B.C. N2L 1P9  
Tel: (519) 273-4667 Fax: (519) 229-3795

A national distributor of high quality DRAM-PETE motherboards, with no costs and computer systems.

### Lexmark Canada Inc.

140 Royal Court Ct., Markham, ON L3R 1G2  
Tel: (905) 461-1360

Lexmark's network line printer, the Open series, features "PrintWorks" as an implementation of the Networking Alliance Protocol (NAP) for bi-directional communication with a printer or a LAN.

## M

### Meckle Enterprises Ltd.

6350 128th Street, Floor 10, Edmonton, AB T6C 1H2  
Tel: (403) 250-2346 Fax: (403) 259-2319

A distributor of multimedia speakers, Texas keyboards, UN-X keyboards, Seeger keyboards from JABA power supplies, monitors, QUMBERT, motherboards, ESI SCSI card, RICOM/TDE HD removable disk and accessories.

### Megahertz

3300 10th St. E., Mississauga  
5429 W. Service Rd., Burlington, ON L7L 4C7  
Tel: (905) 338-8147

Megahertz is a distributor of computer products for mobile computer products.

### Merkin Computer Corp.

301 Waterfall Drive, Markham, ON L3R 1P3  
Tel: (905) 475-5150 Fax: (905) 475-6155

A national distributor of computer hardware and software.

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Fax: (514) 444-2696  
Toll Free: 1-800-637-6477



## sourcing directory

### Small offices

Abbotsford, B.C.: Tel. (604) 825-6125; Fax: (604) 825-6847  
Tel/Fax: 1-800-261-8789  
Vancouver, B.C.: Tel. (604) 273-3460; Fax: (604) 273-4215  
Tel/Fax: 1-800-440-8310  
Calgary, AB: Tel./Fax: (403) 242-7710; Fax: (403) 242-3416  
Tel/Fax: 1-800-441-8311 (Canada only)

### MDC Technologies Canada

6225 Avenue Duroc, Mississauga, Ont. L5T 2E3  
Tel: (905) 270-3446; Fax: (905) 270-3581

MDC is a premier reseller hardware manufacturer. MDC manufactures Years notebook computers, Multimedia Monitors, Multimedia CD-ROM drives, multimedia desktops, image digitizers and Ready Video-mail systems. MDC also manufactures BNC servers and workstations for Windows NT.

### Novell Canada Ltd.

2900 Keele St., Etobicoke, ON, L3J 1T3  
Tel: (416) 284-8670

Novell's NetWare is an open network operating system with more than 40 million users based on UNIX technology, and deployable on a wide variety of industry-standard hardware. A graphics driver simplified user interface application support, and fully integrated Novell and Novell's XFree86 server. Novell's NetWare User Group is providing products such as OnConfig for and Profiler/Officer managing business applications via our productivity-enhancing package.

## O

### Oracle Corp. Canada Inc.

126 Melrose Blvd., Mississauga, Ont. L5J 1P4  
Tel: (905) 824-1180; Fax: (905) 826-1287

A software developer specializing in transaction processing tools for CASE, application development and office automation, and application packages for accounting, human resources and manufacturing.

## P

### Pacific Rite Distribution Corp.

Box 425 - P.O. Box 200, Coquitlam, B.C. V3B 3W6  
Tel: (604) 259-0233  
Fax: (604) 259-0298

Distributors of CIGARTE, Silicon Star motherboards, Western Digital, TVM, GVC, Sigma, Intel and Western's products. They are also a system house for Logix Business Computer Systems, Phoenix/PDS/USA, sparc with 3 years warranty.

### Pacific Royal Enterprises Ltd.

203-11899 Coquihalla Road, Richmond, B.C.  
Tel: (604) 279-4719; Fax: (604) 279-6759  
Tel/Fax: 1-800-538-2212

A retail provider specialist, Pacific Royal Enterprises offers notebook solutions only. Pacific Royal is the exclusive Canadian distributor of Jetbook and Sharebook notebooks computers, the Beamer and DiscBook projectors. Units are available barebone or in intelligent modular PC configuration with PC Cards. Touch screen version, or for desktop replacement. New products include: Stereo phone w/ video capture, StereoFax/modem, voice & pager on one PCMCIA card, clip-on Touch Screen,

and much more. The focus is high quality portable computing, call (604) 279-4719, 1-800-538-2212.

### Packard Bell Electronics

1927 Thorne Dr., Mississauga, ON L5T 2B5  
Tel: (905) 274-1120

Packard Bell is displaying its new Executive line of PC-compatible computers designed for professional and corporate users. Systems range from Intel 486/386 based desktops to Pentium desktop and minitower configurations. Both low-profile and non-low-profile configurations are on display.

### Pai-Tech Marketing

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Porte Agent protocol, the Porte RAS, is a Router Access Server for Ethernet LAN access.

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29 Technology, Inc., Inc., CA 92718, USA  
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# MS OFFICE: This Suite Smells of Success

By Alex Zitman

**W**indows 95 is nice, but while it does a pretty good job of running the current generation of applications, it really needs new applications to take advantage of all its improvements. It really shouldn't come as much of a surprise, therefore, that Microsoft is revamping virtually *existing* products line to run as native, Win95 applications.

The flagship of Microsoft's armada is the MS Office suite—it should come as no surprise that MS Office 95 was released on August 24th—the same day as Windows 95 itself—right as well gave everyone in those long lines something else to buy! (well—nearly ready. The update to Access, the database included in the Office Professional package, isn't quite out of beta-testing yet. Instead, purchasers of the Pro package get the Access 2.0, with a coupon for a free upgrade when the Win95 version is ready.)

In the past few years, software suites have become big business—accounting for the majority of sales in word processors and spreadsheets, for example. Despite competition from Lotus SmartSuite and Novell (formerly Word Perfect) PerfectOffice, MS Office has garnered over 70% of suite sales. Where in the former DOS world, Microsoft seemed to always have the also-ran contender in word processor and spreadsheet sales, the combination of Windows and suites has pushed them into a comfortable sales lead.

## Take Advantage Of Windows 95

Many of the improvements that Office 95 users will like best aren't really improvements to Office—they are common to any programs designed for Win95. Users quickly learn to enjoy long file

names, for example—something that Mac-users have appreciated for 6 decades. No more Q3-95BLD.DOC to identify that "3rd Quarter 1995 Budget" word processing file (But Win95 automatically creates a standard DBF 8+3 file name as well, so the file can be used on computers or with software that's not up to long filenames yet).

All Win95 applications must be written as 32-bit software, rather than the 16-bit versions standard with Windows 3.x. This doesn't automatically make them run faster. The 32-bit Windows NT versions of MS Word and Excel, for example, run slower than their 16-bit equivalents, because they left out the highly-optimized programming code of the older versions in order to be compatible with NT on a wide range of CPUs.

The newer Win95 versions of these programs, however, do feel snappier than the last generation. And, as 32-bit programs, Windows 95 will run them in separate multitasked sessions—making them harder to crash by some other multitasking program. These are big programs, however, and while they'll run (at least one at a time) on 8 meg machines, you might want to consider upgrading to 16 mega if you're going to run them regularly, especially if you need to run several at once.

Win95 allows new programs to be multi-threaded—to run separate processes in the background to improve performance. The Of-

fee applications don't make much use of multithreading, however, adding it only to printing.

A nice Win95 feature that may take getting used to is "Scrap"—you can now highlight part of a document, and drag it to the desktop, where the scrap can sit and wait for you to drag it into a different document or even a different application. Use it, for instance, to drag an address from a letter, and drop it into a contact list... but like the other features, only available with Win95-compatible applications, like all of Office 95. Similarly, right-clicking on the desktop gets you the standard Win95 popup menu—choose New to simply create a new Word or Excel or PowerPoint document. In fact, as with Win95 in general, right-mouse clicking is implemented throughout Office 95.

Office 95 applications also all make use of Win 95's Exchange client—you can send e-mail from any of them, or use it to share information across a network. You can also use Word to edit your Exchange e-mail. Help items in all the applications can automatically connect you to the correct forum on the Microsoft Network (if you have registered for an account!).

## Working Together

Suites have been marketed as bargains—a way to get three or four applications for the price of two. Office continues in this tradition, as before, bundling MS Word word processor, Excel spreadsheet, and PowerPoint presentation graphics (plus the Access database in the Pro version). Schedule Plus, a group scheduler and personal information manager that debuted in

# MS Office 95

*is better than previous versions*

*—Microsoft's programmers worked on using as much common code for all of the applications.*

Windows for Workgroups has been moved from the core Windows package into Office (WTWG users can get a free upgrade of Schedule + from Microsoft).

As well, sales marketing has claimed that purchasers would find it easier working with a collection of applications that shared the same interface. Unfortunately, reality has not always lived up to this—the applications found in suites may come in one box, but have tended to leave more than a little to be desired in terms of working together.

Office 95 is better than previous versions in that way—

Microsoft's programmers worked on using as much common code for all of the applications they share File Open and Save dialog boxes. For example, enhancing Win95's standard dialogues with Pictures of the selected files and integrated search. While users of Word 6.0 could run AutoCorrect, now that feature appears across the Office, as does a new help extension, the Answer Wizard. A nice touch is the vertical scrollbars—you can now see what page number you're scrolling to. Common spell checking dictionaries, including user-customized dictionaries.

You can open these applications from Win95's Start Menu, but by default, you get the Microsoft Office Shortcut Bar, replacing the previous version's amateur Microsoft Office manager (MOM). The Shortcut Bar (try, no exclamation) floats on the desktop, or can be anchored to an edge of the screen, and you can add any Win95 shortcut to it, by just dropping it onto the Shortcut Bar—making it an easy way to access any of your favorite applications, whether its part of Office or not. You can have multiple Shortcut toolbars—it's configurable enough that some users may find a preference to Win95's Start Menu for most of their computing.

In addition, Office adds a new kind of document—a Binder file. This lets you combine data from any of the Office apps, or other Office-compatible software into a single, notebook-like setting...as easily as dragging them

in. You can number pages, or check spelling, as if that was a single file, regardless of the source of the data...a step in the direction of working with documents that fit your data, without having to start off with single applications. Because the Binder uses OLE 2, as you change to a page created in a different application, you don't open that application—your tool bar and menu change to fit the data (OLE 2 works much more smoothly in Win95 than a previous version—but still demands a lot of RAM).

Several years ago, Microsoft promised a single, Visual Basic-based macro language, that would be supported across its applications. While Excel has supported Visual Basic for Applications, Word and PowerPoint still lack that support. Word and Excel continue to use the same file formats with the previous versions, but PowerPoint and Access produce new, incompatible files.

### Working Separately

The applications in Office95 benefit from being designed for Windows95, and to share the common features of Office. Otherwise, the actual interface-sets of the separate applications are not dramatically changed from the last generation. That's not a bad thing—Word 6.0 and Excel 5.0 were both rich with features that many users still haven't had a chance to fully get used to.

All applications in the suite now sport a "7.0" version number—even though in some cases, this means jumping a few numbers (Excel 5.0 to 7.0, Access 2.0 to 7.0—Word skipped in the previous generation, from 2.0 to 6.0—now it does, shares the 7.0 moniker).

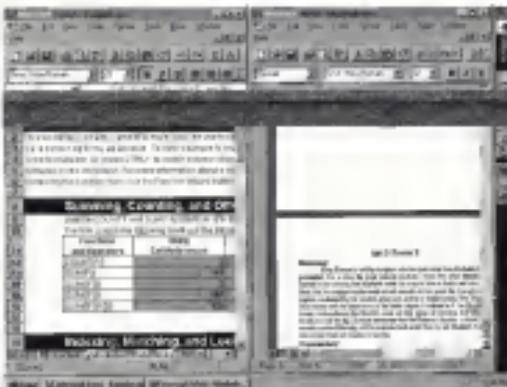
Word 7, for example, builds on the previous version's Auto-features, sometimes feeling like it's become Auto-everything. As before, you can AutoFormat (now available in all the Office apps) so that when you type "the", you get "the". Now you also get auto-bullets. Starting a line with "—" gets you the default bullet symbol. Start with a number, and you get a formatted numbered list. Headers auto-format. A row of dashes becomes an instant border.

Please on your typing, and your spelling can be checked...this seems to work more smoothly than a similar feature in the beta of Lotus's Word Pro that I recently looked at—there, every word typed appeared as a mistake until you flushed typing it by pressing the spacebar...a disconcerting change of colour.

Auto-mania also comes to Excel AutoCorrect, again. But also AutoComplete—like in QuicKeys or MS Money, start to type in a previously-entered name in a cell, and it fills to the rest for you. Highlight a bunch of cells, and the total is automatically calculated, and displayed on the bottom of the screen.

New in Excel 7.0 is Data Mapping, a feature that presented on Lotus's 1-2-3, release 5. Data in a spreadsheet can be translated into a colour-coded map, as easily as into a chart. A basic set of maps is included, with the promise of more from third-party suppliers (no neighborhood map of Vancouver, as yet).

Another steal from Lotus SmartSuite is tighter links between the spreadsheet and the database programs, in this case, Excel and Access. Users will have to wait for Access 7.0 to see these in action, however.



I wasn't too impressed with the Windows for Workgroups version of Schedule, preferring Lotus's Organizer as a simple personal information manager (PIM). I haven't used anything in the Office 95 Schedule - thus changes that opinion - but if you don't currently use a PIM, it's worth a look; it is more fully-functional than the previous version. As well, it is well-integrated into the rest of Office. For example, you can pull names and addresses out of Schedule + into a Word letter. Oh - it also includes a Wizard to work with that Times computer watch.

And I haven't looked at Powerpoint, Office's presentation graphics program - I'm saving it until I can compare it, head to head, with Lotus's new, Windows version of Impression Graphics.

Like all of the current suites, Office 95 is a hefty program, that can demand a lot of RAM and hard drive space. It can be installed in a single finisher, taking a mere 27 megs, or can be set up to run off a CD-ROM drive (which still asks for 38 megs of hard drive space). Microsoft claims a typical installation will require about 55 megs of space — a full install takes 89 megs. If you find yourself regularly opening Word and Excel at the same time, perhaps to drag a spreadsheet chart into a word processing document, you'll be best off with 16 megs of RAM. If you get the CD version, you get the bonus of Microsoft Bookshelf on the disk — a useful collection of reference tools (dictionary, thesaurus, atlas, deskencyclopedia, famous quotations, etc).

Home users and some small offices running Win95 may find their needs better served with one of the new generation of all-in-one programs, such as Microsoft Works-95, or the soon-to-be-released Claris Works 4.0.

Even though the bigger improvements users will find with this suite come from Windows 95 (like long file names) rather than from the core applications, at the moment, this is the product of choice for business users running Win95. Even when Lotus and Novell release their Win95 competitors, in a few months, this will remain the one to beat. □

**About the author:** Alan Zweier can be reached by e-mail: [alan.zweier@compuserve-player.com](mailto:alan.zweier@compuserve-player.com)



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## Frequently Asked Questions

# Pentium OverDrive

*Information from Intel Corp.*

### What is a Pentium OverDrive processor?

The Pentium OverDrive processor is the highest performance OverDrive processor upgrade available today. It provides a simple, inexpensive performance upgrade for most Intel486 and IntelDX2 systems, as well as a superior upgrade option for many Intel486 SX and DX CPU-based systems.

### Is the Pentium OverDrive processor really a Pentium processor?

Yes, it is a true Pentium processor. It is based on 2.3 volt, 6 microsecond Pentium processor technology, the same used by 75 through 130-MHz Pentium processors available today.

In addition to featuring Pentium processor superscalar architecture, enhanced on-chip cache and faster floating point, it offers a 32-bit interface, an on-package voltage regulator and fan heuristic, and a 5.2 core/bus ratio that operates the OverDrive processor at two and a half times the speed of the system bus.

### How much does the Pentium OverDrive processor cost?

The Pentium OverDrive processor is available in two varieties, based on the bus speed of your Intel486 system:

The 63-MHz Pentium OverDrive processor is designed for upgradable 66-MHz IntelDX2 CPU-based systems, as well as upgradable 33-MHz Intel486 SX and DX CPU-based systems. The suggested list price is US\$399.

The 63-MHz Pentium OverDrive Processor is designed for upgradable 50-MHz IntelSX2 and IntelDX2 processors, as well as upgradable 25-MHz Intel486 SX and DX processor. The suggested list price is US\$279.

### How do I know it will work with my system?

The Pentium OverDrive processor will upgrade most Intel486 CPU-based systems with a larger 237- or 238-pin socket. For information on whether or not a specific system supports an OverDrive processor, contact your system manufacturer, local computer dealer, reseller or check the Intel OverDrive Processor Upgrade Guide which contains over 5300



system model listings. The Upgrade Guide is available on the WorldWide Web: <http://www.intel.com/proces/oracle>.

### How much of a performance increase will be gained with a Pentium OverDrive processor?

In comparing the relative performance of the Pentium OverDrive processor with a 66-MHz IntelDX2 CPU-based system, the Pentium OverDrive processor has an iCOMP index of 581 (iCOMP stands for Intel Comparative Microprocessor Performance Index and reflects the relative performance of Intel microprocessors), representing a 96 percent increase over the 66-MHz IntelDX2 CPU-based system with an iCOMP index of 297.

The Pentium OverDrive processor delivers a substantial performance increase for many of today's applications. For example, an upgraded 66-MHz IntelDX2 CPU-based system will realize more than a 50 percent performance increase across most typical applications like Word for Windows, CorelDRAW, and Quicken for Windows v 3.0.

### Will the Pentium OverDrive processor support Windows 95 and new advanced applications?

Yes. The Pentium OverDrive processor will provide a significant performance boost to process or demanding operating systems like Windows 95, Windows NT, and OS/2 Warp, as well as many emerging communications, multi-

### taking and multimedia applications.

For example, preliminary testing on an Intel486 SX or DX CPU-based system with 8MB RAM demonstrates that the Pentium OverDrive processor accelerates some applications running under Windows 95 by over 200 percent. Similar testing on an IntelDX2 CPU-based system with 8MB RAM shows a 75 percent acceleration.

### Will a Pentium OverDrive processor help the performance of games?

Yes. By upgrading the system CPU, keyboard and cursor responsiveness improves as well as the quality and detail of the graphics. In fact, many of today's games are designed to offer different layers of detail based on the performance of your system's CPU. These games will recognize the system's Pentium OverDrive processor upgrade and automatically turn on key graphic features without sacrificing performance.

### Doesn't a memory upgrade make more sense for Windows 95 than an OverDrive Processor upgrade?

Windows 95 and other advanced applications work best with more processing power and memory than previous generations of software. The best upgrade choice depends on your system's present configuration and the types of applications you use.

If your system already has 8MB RAM or more, the Pentium OverDrive processor provides the greatest performance boost. For example, when you upgrade an Intel486 SX or DX CPU-based system that has 8MB RAM with an Pentium OverDrive processor, the system performance gain might between 100-200 % as compared to a memory gain if you just add an additional 8MB RAM.

If your Intel486 system has 4MB RAM, preliminary in-house Windows 95 testing indicates that the best value in performance gain is achieved through the addition of an Intel Pentium OverDrive processor and an additional 4MB RAM, both of which easily fall within a US\$300 budget. □

**PEOPLE****Novell gets new VP and GM**

Tom Peart, senior VP, Americas Sales for Novell, Inc. announced the appointment of Don Chapman as VP and general manager of Novell Canada Ltd.

Don Chapman has more than 20 years experience in the Canadian high technology industry. As VP of sales and marketing at Renaissance Ltd., he was responsible for their Canadian, US, UK and European operations. At IBM Canada Ltd. he held several sales and marketing positions.

"Don Chapman's track record as a general manager and his strong knowledge of the channel will be a great asset to Novell Canada," said Peart. "Don has the experience to focus our efforts in providing our customers with the tools they need to communicate - at work, at home, or any place where they need information."

"I believe in Novell's strong technical depth. There is a tremendous opportunity for growth in the networking and application

markets," said Chapman. "I look forward to working with our channel partners in bringing Novell's industry leading networking operating systems, infrastructure, applications, and information needs products to market."

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*John Fong, President of EMPAC and Albert Kim, President of Samsung Electronics North America*

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# Internet



Barbara Aitken

## Why a site on the Internet should be part of your strategic marketing plan

The other day I was wondering what someone would have to do to escape the barrage of information that seems to be escalating daily about the Internet. Go to a movie related? Take views of software? The best solution I could come up with might be to retreat to a community where technology is banned.

That is how all pervasive this computer network of over 45,000 computer networks has become, and with good reason. Anything that gives anyone the ability to move millions around the globe instantly is bound to the revolutionize. Which is why the Internet has been compared to the invention of the printing press. When you consider the sweeping changes Gumpert's assessment insured, it becomes clear that soon it won't be a question of whether you'll use the Internet for business or not; it will be how soon you get on.

Like other technological innovations that give companies the upper hand, the Internet will empower those who know how to use it effectively and leave those who don't, far behind.

Another more positive way of looking at all this exposure to new information creates change. And, as we know, with change comes opportunity. With 40 million users on the Internet now, 100 million within a year and half a billion by the year 2000, the "Net" offers tremendous opportunities for business. These include:

- Selling products and services
- Test market acceptance of products and services
- Sales promotion
- Gathering valuable customer information
- Building customer support
- Access to global research and information resources

- Two-way communication with public keys
- Global e-mail and fax via a local phone call

If you are interested in doing business on the "Net," one of the most exciting places to be is the World Wide Web. With over 30,000 sites from the United States and Canada alone, the World Wide Web is the fastest growing area of the Internet, thanks to its graphical and hypertext capabilities. Visitors to the Web, who number about three million now, are growing by 25 per cent every month. It is estimated that 22 million will be using the Web by the turn of the century.

Who are all these people?

Demographic information culled from several studies so far suggests that the majority, 66 per cent, are male while 34 per cent are female—figures that show a definite increase in female participation over earlier studies. The average age of users are spread pretty evenly across age categories from 18 to 54. Most work for large companies, over half are white collar workers, and over three quarters have a college education and earn over \$45,000 U.S. Roughly a quarter of users say they purchase online, which includes everything from the World Wide Web to America Online, CompuServe, eWorld and Prodigy.

It's a good bet that many of these users are interested in computer equipment and software and related products. It's also likely that they expect to see your business on the World Wide Web—and may be disappointed to know that you aren't available in this arena. If you are forward-thinking enough to have put up a "site" or "home page," you have a real opportunity to present yourself in a way that can result in lots



more business.

The problem is, more often than not, that results are very disappointing. You cannot expect to put up a home page then sit back and wait for the dollars to flow in. It's a seductive thought, but like most new marketing ventures, you'd be wise to invest in some professional help to ensure success. First of all, people must be able to find your site and once they visit, want to return. This means your home page must be registered in the appropriate search engines on the "Net." This is an opportunity in itself to ensure some great "Net" publicity, as many search engines like Yahoo will look over your site and if they like what they see, put you on their Hot List, guaranteeing you traffic.

The competition is becoming fiercer for a spot on the Hot List. And even if that weren't true, you should make sure that your home page is attractive and memorable in some way so that visitors will come back for more. Interactive graphics and writing that is personalized, to the point and keeps the reader interested, these are basic elements that create compelling sites. Contests, promotions, games, making use of the interactivity that is unique to the Net should be considered when you are planning your site. Contests are very popular on the Web and they allow you to build a loyal customer base—a

valuable tool that you can e-mail regularly with reminders and special offers. In other words, you need to approach your presence on the World Wide Web as a professional way.

Once you have a great site, you should discuss supporting your efforts via traditional and "Net media" to make sure that all of your present customers as well as potential customers know how to find you. And don't overlook the practice of creating your own publicity about your Internet site, especially if yours is a "first" in some way. It's not impossible to generate excellent local news coverage, maybe even TV if your angle is worth a story. That kind of "free" publicity can go a long way to getting the word out about your site.

Also, remember even if customers don't order online they are getting a lot of valuable extra information about products from you in another medium, which may be influential in your retail sales outlets. Putting an Frequently Asked Questions (FAQs) can also save your customer service reps a lot of extra telephone time.

Which brings me to the next point. It's crucial to keep the site new and interesting on a regular basis. Encourage writers to bookmark, reward them to do so. Create promotions and offer regular updates about upcoming offers. Always give your visitor a reason to return. Sites that don't change are called "Dead Web Sites".

As well, if someone e-mails you, make it a priority to e-mail back. This is a key factor to creating a fruitful following.

Here's another common temptation—you've invested some money in glossy brochures. Wouldn't it be great to have the world use them? So you list technical expenses and put those words and pictures online. Sometimes it works. But more often, than not, it doesn't. Viewers may not be interested in wading through all that text. Wouldn't it be more interesting to skeletonize the brochure to give viewers a sense of control over the information they are reading? And also, to identify opportunities within the brochure for interactivity? Take advantage of the capabilities of your new medium!

Linking your site to others which offer resources that are complementary to your products and services is also a proven way to increase traffic. Visitors may use your site as a gateway to much other sites and as a result, bookmark you. If you can convince other sites to link to yours, then you've automatically extended your reach. Linking to resources is also viewed as an extra service to your customers. For example, in a recent site we created for major Ontario real estate developer, Daniels,

we audited and found a number of excellent resources that we knew this builder's family-oriented clientele would find worthwhile—kids' expenditures sites, financial information including how to buy a new home from major banks, gardening and so on. The goodwill that that generates is priceless.

Creating a memorable site generating and increasing visitor traffic, building a loyal customer base, taking advantage of rapid-fire technological advances that offer new opportunities, all of these initiatives require the services of multi-skilled professionals. A word of advice—service providers and other mechanically-oriented specialists do not generally possess marketing, communication or public relations expertise. They are not the best people to manage your site and promote it, even if they advertise this as part of their capabilities. Many service providers will create home pages for you, but do not like that part of the business. It is simply not what they do best.

It is not simply a question of hiring a graphic artist and making your site look nice—another common misconception. It's important to make sure your site is designed from a marketing perspective from beginning to end.

What you will need are the services, either in-house or on a consulting basis, of a marketing expert who also understands the capabilities of the Internet as a new medium and who can work knowledgeably with technical experts.

Think about putting the same thinking and importance on your Internet presence as you would devote to your advertising campaign and you will reap the same benefits! □

**About the author:** Barbara Allen is an award-winning corporate communicator and PR consultant who co-founded Arctic After 4 Associates Inc. Her creative thinking skills and innovative expertise have helped create responsible, effective World Wide Web sites. She can be reached by e-mail at [explor@jfl.infoserv.net](mailto:explor@jfl.infoserv.net)

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## Good CD-ROM producers wear many hats

By Philip Hyams

If you're familiar with PCs, you've probably aware of the phenomenal impact which CD-ROM technology is making today in the computer field. A CD ROM looks exactly like an audio CD, but the similarity stops there. A CD-ROM can store not only audio, but also video, computer data, photographs and animation. This makes CD-ROM ideal for multimedia programs. One can acquire a CD-ROM drive today for about \$150.00. The past year has seen an incredible number of CD-ROM titles launched in the international marketplace, everything from games and education to productivity and training. Taking the above into consideration, we must also realize that the single, most important factor in all of the changes taking place today in the realm of computer technology, is undoubtedly the human one.

Remarkably, there is a serious shortage of multimedia producers to meet the demands imposed by new technological developments. In an era of changing economies and revolutionary technologies, the profession of CD-ROM Producer, like no other, epitomizes the skills and "knowledge worker" talents required to successfully create and compete in this new age of cyber-business and global marketing. Yet, there are still very few multimedia producers active in this remarkable and cutting-edge field. I interviewed, Claudio Biocchi of Macroform Inc. - one of Canada's foremost interactive multimedia producers to find out why, but also to find out what the future may hold for all of us.

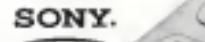
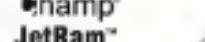
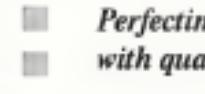
CCW: Claudio, the words "interactive" and "multimedia" are being used so frequently today. I wonder if people really are aware of what those terms mean? Could you define what a multimedia or CD-ROM producer is?

Claudio Biocchi: Well, a multimedia producer is an individual that is competent in a wide variety of different technologies and art forms, a person who is able to combine many forms of technology and art into a cohesive final product, such as an interactive CD-ROM

CCW: Why are multimedia producers in such demand today?

Claudio: First of all, because of the recent boom in computer hardware and powerful game plat-

forms, CD-ROM drives, optical cables and so on. Since it is really a position which only developed in the past few years due to the advent of interactive technology, it is extremely



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# INTERVIEW

difficult to find people who have experience in multimedia producers. There are individuals with experience in the various fields which multimedia incorporates, but usually, they are only qualified in one or two of the disciplines required to produce a successful multimedia product. So you see, it is hard to find that specific someone with experience in the wide variety of fields which multimedia encompasses.

**CCW** How did you get started?

**Claudio** My background includes programming, creative direction and marketing. In 1989, I joined forces with my father, and about four years ago had the opportunity to move Microforum into multimedia production. At that time it was a gamble but it paid off. Right now, Microforum is the largest producer of CD-ROM products in Canada. A few years back, if someone had told me that I was going to end up with one of the toughest jobs in the world...well...I wouldn't have believed that

person. I have produced over 30 CD-ROMs from games to educational products and every project gets harder instead of easier. The fact is that the technology has expanded the creative processes, and in order to create a high-quality CD-ROM product, the multimedia producer must have the expertise in the required fields for product creation.

**CCW** Why is it so difficult to be a multimedia producer?

**Claudio** First of all, let me explain a bit about interactive multimedia technology. With a CD-ROM product, you are able to interact with a variety of different technologies such as Video, Animation, Graphics, Programming and Sound. It takes an exceptional individual to keep up with such difficult technology in order to get the most from it. For example, only a few years ago you could only play a small video clip on your computer. Today, you can play full-size video. In fact, the new fast-action game we are about to launch, "Expert No Mercy", is using technology that did not exist six months ago. The technology is just changing too fast. It's so hard to keep up with it! So, you see, these things make the job of multimedia producer quite demanding.

**CCW** Then, what does it take to be able to produce a good interactive multimedia product?

**Claudio** The multimedia producer must be able to perform a wide variety of functions. He or she must be a writer, a video producer, an animation director, a creative director, a project manager and a marketing specialist, to name a few! But please don't get me wrong, I wouldn't want to discourage any future multimedia producers reading this. All of the skills I mentioned can be acquired over time and with experience, or the necessary talent can be hired at budget-cost. The important ingredients required to succeed as a multimedia producer are drive and creativity, as well as the ability to really enjoy learning and working with new technology.

**CCW** Do you actually fulfill all those functions you mentioned?

**Claudio** Not anymore. Right now I have a team of more than forty talented people who help me to produce our CD-ROM products. But when I opened, I basically had to do everything myself! However, I still apply the skills I acquired through the years, to everyday

situations which arise here at Microforum.

**CCW** How much money is required to produce a multimedia product?

**Claudio** I have produced products for as little as \$3,000 and as much as \$1 million. Obviously the more money you have, the better chance you have for the product to succeed. But there are ways to produce a CD-ROM economically and still make it a success. The majority of money is usually directed to marketing. Therefore, one way to save money is to form a strategic partnership with a company which can handle distribution. For example, right now we save money on our products by distributing them ourselves in more than 30 countries. We often are approached by smaller multimedia producers to help them market their products.

**CCW** What will the future bring for multimedia production?

**Claudio** I am convinced that the future of CD-ROM and multimedia production will be as great as the feature film business. Every year the budgets on interactive multimedia production are shooting up and I definitely see a lot of job opportunities materializing in this field in the near future. Microforum is always looking for talented CD-ROM producers. □

**About the author:** Philip Byam is a freelance communications consultant and writer living in Toronto.

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Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Prov. \_\_\_\_\_ Postal Code \_\_\_\_\_

Tel. ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

(must be signed to be valid)       D       Y

Are you involved in the selling, reselling, and/or distribution of computer/networking systems, software or services?

Yes     No

Which best describes your job function? (check one only)

- President/Chairman
- Branch, store, division, regional manager
- Channel, retail, value added reseller and manager
- Purchasing and procurement manager
- Product development manager
- Computer consultants
- Technical management
- Design, system and application engineers
- Marketing, sales manager

## COMPLIMENTARY SUBSCRIPTION

Which best describes your firm's primary business? (check one only)

- Hardware/software resaler
- Mass merchandiser
- Consumer electronics/office machine resaler
- Value added distributor
- Distributor/wholesaler/busines manufacturer/CEO
- Software developer
- Systems integrator/Software consulting
- Government purchasing agent
- Computer maintenance/service company
- Other third party and allied service firms

The system(s) you organization integrates or resells are based on the following: (check all that apply)

- DOS/Compaq       Networking
- OS/2/Compaq       Unix
- Windows NT       Macintosh

What is the number of employees at this location?

(check one only)

- 10,000+ plus       200 - 499
- 5,000 - 9,999       100 - 299
- 2,000 - 4,999       20 - 99
- 1,000 - 1,999       Less than 20
- 500 - 999

What are your firm's approximate gross annual sales?

(check one only)

- Over \$50 million       Over \$1 million - \$10 million
- Over \$25 million - \$50 million       Over \$1 million - \$5 million
- Over \$10 million - \$25 million       Under \$1 million

All questions must be answered. Incomplete cards will not be processed. The publisher reserves the right to determine qualification.

PLACE  
STAMP  
HERE

# Canadian Computer Wholesaler

THE COMPUTER RETAILER'S HANDBOOK

900 - 1788 West Broadway  
Vancouver B.C. Canada V6J 1Y1